IV. Accomplishments and Impacts of Demonstration and Access Projects

The ultimate test of the merit of TIIAP-supported networks is whether the communities being served benefit. This chapter describes the most significant outcomes of the demonstration and access projects funded in 1994 and 1995. Specifically, it addresses the types of impacts on direct end users, on the overall community, and on the organizations administering the projects. It also discusses those areas in which TIIAP projects exceeded or fell short of achieving their goals. The chapter concludes by assessing the impact of TIIAP support on the initiatives.

KEY FINDINGS

Many programs perceived technological achievements to be their primary accomplishment. Others identified community improvements that resulted from their technological achievements. When survey respondents were asked to identify their project's single most important outcome, just over half of the projects used this open-ended item to describe a *technological* achievement (e.g., "provided a technology backbone for the community and region"). The remaining projects used this open-ended item to describe a *community impact*.

Successful demonstration and access projects shared a set of common traits. First, across all application areas, successful projects addressed community changes goals that would benefit the greatest number of community residents. Second, they tackled community problems that were specific, well defined, and easily addressed through technological innovations. Third, they involved community stakeholders who were in a position to bring about the types of changes needed to resolve their problems. Conversely, projects addressing complex social issues that are influenced by factors beyond the control of the stakeholders (e.g., reducing poverty) generally reported less success in achieving their community change goals.

TIIAP projects successfully reached underserved community segments. Ninety (90.2 percent) of the 1994 and 1995 demonstration and access projects provided benefits to disadvantaged or underserved community segments. Nearly two-thirds of the projects reached end users (65.2 percent) and indirect beneficiaries (61.4 percent) who lived in rural areas. The percentage of projects impacting people living in geographically isolated areas and people living in conditions of extreme poverty were nearly as high (59.8 percent and 59.1 percent for end users and 57.6 and 66.7 percent for indirect beneficiaries, respectively). Not surprisingly, end users tended to be concentrated (e.g., in a single community, in one or two adjacent counties in a state), while indirect beneficiaries were more dispersed (e.g., all counties in a state).

The magnitude of impact for TIIAP projects was extensive. The demonstration and access projects estimated that they provided services to over 10 million end users. The number served by individual projects ranged from a minimum of 15 to a maximum of 5 million (for a health demonstration project). The majority of projects, however, reported serving between 400 to 20,000

end users. In addition, the number of end users impacted was found to be associated with the length of a project's grant period, implying that funding projects for a longer duration to ensure that they have adequate time to get up and running may pay off in terms of the number of end users who are ultimately impacted.

The TIIAP projects strengthened organizational partnerships. Over half (52.7 percent) of projects reported that the grant recipient's relationship with its partner organizations changed as a result of the project. Among projects reporting a change, over 90 percent indicated that they had forged stronger and expanded working relationships with and among their partner organizations. In many cases, these organizations have continued to share information and work closely on the continuation of the project. Additionally, a number of projects reported new joint ventures that were direct outcomes or expansions of the TIIAP project.

Over 80 percent of TIIAP projects disseminated information about their initiatives. Most notably, projects reported responding to almost 79,000 unsolicited requests from outside organizations. In addition, they provided written materials to over 335,000 organizations (although some of these materials may have been designed to describe the project to potential end users, as opposed to other organizations). A significant number of organizations (5,489) received project information through site visits or tours. There was a fairly strong correlation between the length of the grant period and the number of dissemination recipients, suggesting that funding projects for a longer duration increases a project's dissemination activities.

TIIAP projects have promoted the diffusion of innovative applications of information infrastructure. Most projects (85.9 percent) and all of the community networking demonstration projects considered their TIIAP projects worthy of replication. In addition, over two-thirds (69.6 percent) "strongly" or "moderately" agreed that their project innovations provided a "marked advantage" over alternative ways of providing similar services; three-quarters (75.6 percent) indicated that their innovations were easily documented and, therefore, could be easily communicated to others; and just over two-thirds (68.9 percent) indicated that their project innovations could be easily implemented by others with a reasonable amount of effort and expense. Furthermore, one-third (34.2 percent) of respondents indicated that they knew of other organizations that had used information about their TIIAP-related activities to undertake similar ventures. These respondents cited over 80 specific organizations that had adopted ideas from their projects.

Federal funding has been crucial to the success of these initiatives. Three-fourths (75.2 percent) of projects reported that they probably never would have been implemented without the support they received from the TIIAP program (the remaining 24.8 percent indicated that they would have been implemented using alternate funding sources). In addition, projects that received a larger TIIAP award appeared to be less likely to perceive that they would have been able to obtain alternative funding.

RESPONDENTS' PERCEPTIONS OF THEIR PRIMARY OUTCOMES

The survey provided demonstration and access respondents the opportunity to describe, in their own words, the single most important outcome that resulted from their TIIAP projects. As might be expected, our analysis of patterns and common themes resulted in two primary outcome categories: (1) technology-related achievements, and (2) impacts on project end users and indirect beneficiaries.

Technological Achievements. Just over half of respondents discussed their project's major outcome in terms of technological achievements. Many, nearly 20 percent of the overall sample, described the creation or expansion of a network

or technological infrastructure upon which universal access to electronic services, particularly the Internet, could be delivered. For example:

> *Provided a technology backbone for the community and region.*
>
> *Increased access to telecommunications equipment and services.*
>
> *Provided Internet access to 95 percent of classrooms in district and 100 percent of buildings in school district.*

A slightly smaller proportion of respondents specifically discussed access to technology in terms of improving the disparities between the technology haves and have-nots. These responses indicated that traditionally underserved populations, such as the citizenry in rural or geographically isolated areas and Indian reservations, gained equal access to technology as a result of the TIIAP project.

Other respondents, roughly 10 percent of the overall sample, indicated that providing resources and information via technology was their project's most important outcome. They cited the creation of comprehensive databases, online services, and educational information that end users could access through the TIIAP-supported networks. For example, some respondents highlighted the importance of using technology as a tool to improve learning opportunities, while others indicated that the construction of a website was their greatest accomplishment. One project for example, cited the following as its most important achievement:

> *An award-winning, bilingual consumer health site visited by 400,000 people monthly*.

Most of the remaining respondents that focused on technological achievements combined categories to describe how they provided information to traditionally underserved populations. For example:

> *Providing equal access to online library, state and nonprofit information for all parts of the state, particularly rural areas*.

Community Impacts. The second major category of outcomes, identified by just under half of the respondents, involved community impacts. There was considerable variation, however, in both the extent of these impacts and the specific community segments that were identified as directly or indirectly benefiting from TIIAP-related activities. Many of these outcomes were described as broad assertions about the perceived benefits of project activities. For example:

> *Widespread statewide cooperation toward meeting consumers' health information needs.*
>
> *Training high school students so that they can obtain technology jobs in MS once they graduate.*
>
> *The seed of community revitalization has begun to sprout in a historically depressed community.*

Our review uncovered two themes among about the sources of community impacts: (1) collaboration and communication (see Exhibit 4-1 for an example of a project that changed the ways people communicate), and (2) improved delivery of services. Descriptions of outcomes relating to collaboration often emphasized the establishment of regional or statewide networks and the strengthening of partnerships:

> *The statewide network for juvenile justice agencies to share information.*
>
> *Widespread statewide cooperation toward meeting consumers' health information needs.*

Exhibit 4-1
Example of a project that changed the ways people communicate

MOBILE COMMUNITY HEALTH INFORMATION NETWORK
1995 Access Project in Health

The technology TIIAP projects used has greatly enhanced the ways people communicate. For example, the Mobile Community Health Information Network (MCHIN) is a high-speed computer communications network linking professionals in community health clinics to the University of South Alabama (USA) wide area network. USA utilizes an integrated health care delivery system of hospitals, outpatient clinics, primary and specialty physicians, and a medical college. During the grant period, 132 health care users and 134 USA physicians and staff were connected to MCHIN.

The project brought major changes in how many of the physicians on the network access medical information and research; it provided physicians and staff with access to Internet information resources such as the National Library of Medicine. Several of the physicians interviewed during the site visit mentioned the importance of these resources in helping them communicate to patients and work more efficiently. For physicians at more remote sites, the network improved how efficiently they could get medical information. Another rural clinic is using Internet services to find definitions, treatment plans, medication information, and patient information handouts in Spanish.

The technology of the MCHIN project ultimately benefited the patients of the physicians on the network. The people served by the clinics are poor and relatively underserved. Because of the network, physicians were able to work more efficiently and could provide easy-to-understand information about conditions. One of the rural clinics was able to enroll several cancer patients in research programs as a result of listings on the Internet.

Source: 1998 case study.

Quick, efficient, inexpensive communications between 26 nonprofit community development organizations in a 4-state region.

Descriptions of outcomes relating to improved delivery of services frequently emphasized how target populations benefited from modernized equipment or streamlined administrative procedures. For example:

Quality home health visits can be delivered at $35 per visit versus $90 for face-to-face visits and hospitalizations reduced. Admission to nursing homes delayed.

The TIIAP grant channeled into a CDC grant, which lead to the development of the Michigan childhood immunization registry.

A set of online resources for learning network members was created.

The TIIAP helped neighbors to become self-sufficient by providing the tools for getting resources and information without waiting until someone refers them to needed resources and dissemination information. The TIIAP did not achieve this directly but supplied the tools that helped make it happen. Ability to access information and disseminate it.

High schools in rural areas are able to offer advanced courses via distance learning. Rural populations in need of advanced education programs have access locally.

All four major medical centers are pursuing telemedicine program.

Exhibits 4-2 and 4-3 provide examples of case study sites that were able to provide services to a greater number of beneficiaries after making TIIAP-supported improvements to their service delivery mechanisms.

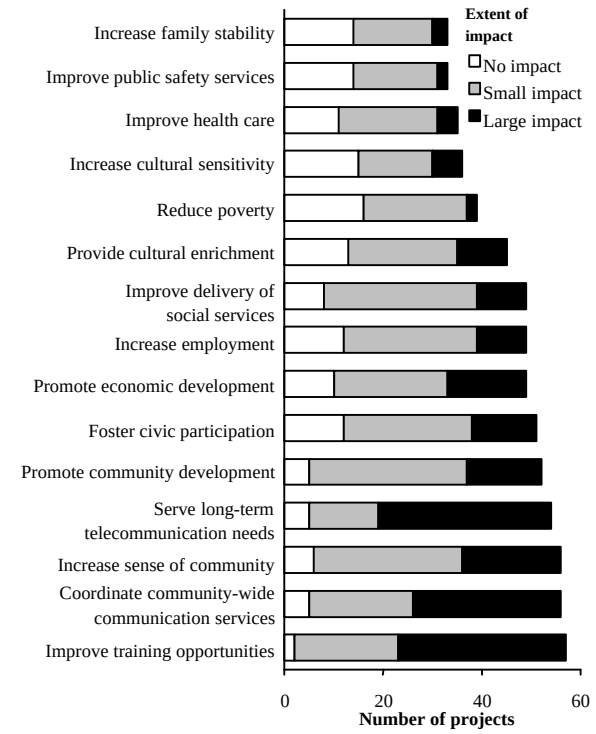
COMMUNITY IMPROVEMENT IMPACTS

In addition to identifying their single most important outcome, survey respondents were asked to (1) indicate which community change goals were applicable to their project, and (2) rate their projects' success in achieving applicable community improvement goals. Because certain community improvement goals are only applicable to projects in a particular field, our discussion is divided among four categories of TIIAP application areas.

Impacts Among Community Networking and Public Services Projects[17]

Survey respondents were provided a list of 15 community improvement goals that pertained to these two application areas. Almost all respondents cited at least one of the following as being an applicable community change goal: improve training and learning opportunities (90.5 percent), coordinate community-wide communication services (88.9 percent), increase sense of community (88.9 percent), serve long-term telecommunication needs (85.7 percent), or promote community development (82.5 percent). Even the two *least* frequently cited goals (i.e., increase family stability, improve public safety services) were identified as being applicable by over half (52.4 percent) of the respondents. This suggests that the demonstration and access projects in these two application areas were designed to achieve a wide range of community change goals.

Figure 4-1
Extent of impact for community improvement goals: 1994 and 1995 demonstration and access grants in community networking and in public services (n = 63)



Note: No impact rating is reported when a specific goal is not applicable for a given project.

Source: 1998 mail survey of grantees.

As shown in Figure 4-1, larger impacts were generally reported for the more commonly pursued goals, and smaller impacts were reported for less common goals. For example, a majority of demonstration and access projects reported large impacts for the following goals:[18]

- Serve long-term telecommunication needs (64.8 percent);

[17] Projects in the community networking and public services application areas are generally working toward similar objectives. We have therefore combined our discussion of the community improvement impacts for these two application areas.

[18] Survey respondents had the option of indicating that a given community improvement goal was not applicable to their project. The results provided throughout this section pertain only to those respondents who indicated that the goal was applicable to their project.

Exhibit 4-2
Example of a project that changed the ways information is accessed and transmitted

SAFETYNET—NEW HAMPSHIRE
1995 Access Project in Public Services

The technology used in the SafetyNet-NH project revolutionized the client intake process in New Hampshire. It increased client access to benefits. One of the advantages to switching to the electronic system from the paper intake process was that the online questionnaire included some questions that intake workers were not previously asking. The program was well paced and asked questions in a logical sequence. Some intake workers reported that interviewing clients using the new system generated more responses than they got by conducting interviews face to face.

The computerized application process also helped intake workers learn about other issues that may be relevant to the clients' welfare. For example, rather than only asking questions required to complete an energy assistance application, intake workers used the online system to collect additional information that may highlight other problems the client is having. One major advantage is that intake workers can collect information about an entire family at the same time.

The software has been able to provide enhanced case management capabilities and more advanced data reporting mechanisms than previously existed. For example, the old system could not provide data breakdowns, generate reports, or produce letters. The new system can provide data breakdowns by a client's sex, age, and income level.

Prior to the online system, intake workers had to rely on their memories to determine client eligibility for programs. The new system prevented intake workers from forgetting about possible sources of assistance and eased concerns of senior intake staff members that junior staff members lacked the knowledge or experience to know about every possible program for which a client could be eligible. It has not changed the role of intake workers, but it has made their work much easier, more effective, and more customer friendly.

Source: 1998 case study.

- Improve training and learning opportunities (59.6 percent); and
- Coordinate community-wide information and communication services (53.6 percent).

In addition, a significant proportion of respondents reported that their TIIAP project had "no impact" for the following four goals:

- Improve the effectiveness of public safety services (42.4 percent);
- Increase family stability (42.4 percent);
- Increase cultural sensitivity and social tolerance (41.7 percent); and
- Reduce poverty (41.0 percent).

It is interesting and encouraging to note that the goals for which the projects claimed the greatest success were both the most frequently pursued and the most likely to affect a broad spectrum of the community. To a large extent, these goals were also ones for which the projects could be expected to have some substantial chance of effecting change. That is, one would predict that TIIAP-supported activities would have a greater chance of improving training and learning opportunities than of increasing social tolerance.

Three sets of chi-square analyses were conducted to test for differences in the extent of impact across project type, length of the grant period, and award amount. These analyses uncovered no significant findings.

Exhibit 4-3
Example of a project that changed the ways benefits are delivered

COMANCHE COUNTY MEMORIAL HOSPITAL
1994 Demonstration Project in Health

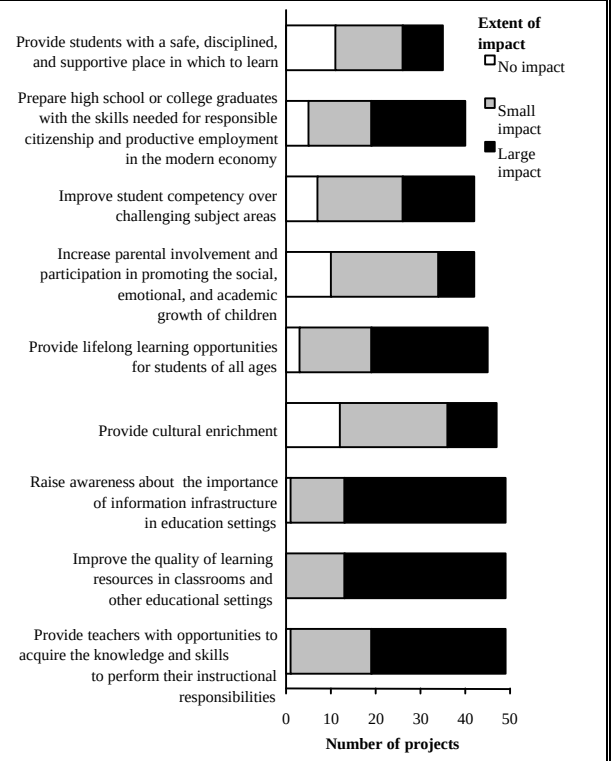
The rural telemedicine project in Lawton, Oklahoma, developed new ways for doctors to deliver medical services to their patients. Frequently, rural physicians must make diagnostic and therapeutic decisions with limited previous exposure or experience with a patient's problem

To provide effective decision support, telemedicine provides e-mail, Internet access, and various hardware and software. These technologies enhance patient care in the rural setting by improving information access for rural physicians and providing specialist interpretation in several hours instead of 3 to 5 days. With the teleradiology system, rural hospitals can scan, send films, and receive typed interpretations on the same day. Emergency readings can be obtained usually within 30 minutes from the time films are sent. Telecardiology, or remote cardiac monitoring, is also possible at three rural sites to support the rural physician and ease the patient's burden.

The qualitative improvement in rural life was illustrated through stories about the people that this system helped. Patients in rural communities can "see" a cardiologist or attend diabetes education classes without having to miss a day of work or drive long distances to an urban health care facility. Thus, people could be treated in their own communities without the stress and expense of being transported to an urban hospital for care. For example, a person in need of speech therapy after a tragic accident received treatment via a videoconferencing link between CCMH and a rural hospital. Other stories included those of patients that were saved from the burden of having to travel for x-rays and cardiac monitoring. Telemedicine in rural areas has been a vital link between rural well-being and quality health care.

Source: 1998 case study.

Figure 4-2
Extent of impact for community improvement goals: 1994 and 1995 demonstration and access grants in ECLL (n = 53)



Note: No impact rating is reported when a specific goal is not applicable for a given project.

Source: 1998 mail survey of grantees.

Impacts Among ECLL Projects

Survey respondents were provided a list of nine ECLL community improvement goals (see Figure 4-2). Not surprisingly, almost all ECLL demonstration and access respondents cited at least one of the following goals as being applicable to their projects:

- Improve the quality of learning resources in classrooms and other educational settings (92.5 percent);

- Provide teachers with opportunities to acquire the knowledge and skills needed to perform

their instructional responsibilities (92.5 percent);

- Raise awareness about the importance of information infrastructure in education settings (92.5 percent); and

- Provide cultural enrichment (88.7 percent).

However, there was considerable variation in the level of success that ECLL projects had in attaining these four goals. Three-quarters (73.5 percent) reported large impacts for two of these goals: providing teachers with opportunities to acquire knowledge and skills, and raising awareness about the importance of information infrastructure in education settings. A smaller proportion (61.2 percent) reported large impacts regarding their efforts to improve the quality of learning resources in classrooms, while less than one-quarter (23.4 percent) reported large impacts as a result of their efforts to provide cultural enrichment (in fact, 25.5 percent of respondents who cited this as an applicable goal reported no impacts).

Several other findings are worth noting here. Almost four-fifths (79.2 percent) of respondents cited increasing parental involvement as being an applicable goal for their project. Only 19.0 percent of these respondents reported large impacts for this goal, while 23.8 percent reported no impacts. In addition, one-third (31.4 percent) of respondents who indicated that their projects were designed to provide students with safe learning environments reported no impacts. A possible explanation for the differing successes in meeting these goals may be the degree to which a given end result falls within an educational institution's sphere of influence. For example, the two goals with the greatest impact involve working with school staff who are directly accountable to the educational settings in which they work. The three goals with the least impact involve entities outside a school's direct control—parents, cultural artifacts and experiences, and the community setting. Parental involvement is notoriously difficult to bolster. Access to museums and other cultural institutions is often limited by time, distance, and finances. And a school can hardly be held responsible for the neighborhood in which it is situated. Nonetheless, these findings suggest that future technology projects that elect to tackle these goals would likely benefit from the experiences of the early TIIAP projects that did report large impacts in these areas.

Three sets of chi-square analyses were conducted to test for differences in the extent of impact across project type, length of grant period, and award amount. No statistically significant differences were found.

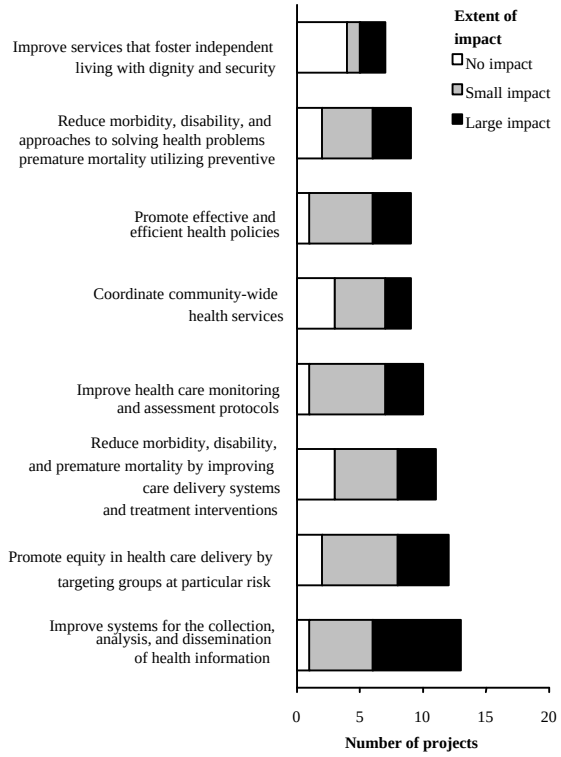
Impacts Among Health Projects

The community improvement impacts reported for the 16 health projects were, in general, weaker than the impacts reported for the other application areas (see Figure 4-3). And for the most part, the highest impacts in this area were reported for the more commonly pursued goals. The strongest community impacts by far among health projects were reported for improving systems for the collection, analysis, and dissemination of health information (81.3 percent). This was the most commonly pursued goal and also the goal most dependent on telecommunications and information technologies. Large impacts were reported on this goal for seven (53.8 percent) of the applicable projects.

Among health projects, the weakest community impacts were reported for the least commonly pursued goal. Four of the seven applicable projects (57.1 percent) reported that no impact occurred with respect to improving services that foster independent living with dignity and security.

There were too few health projects to conduct valid comparisons across project type, length of grant period, or award amount.

Figure 4-3
Extent of impact for community improvement goals: 1994 and 1995 demonstration and access grants in health (n = 16)



Note: No impact rating is reported when a specific goal is not applicable for a given project.
Source: 1998 mail survey of grantees.

Impacts Among Public Safety Projects

The three public safety projects in our sample reported community improvement impacts for a set of community improvement goals specific to their application area. All three projects reported attempting to prevent and deter crime, fire, accidents, and other threats to public safety. In addition, all three projects reported small impacts on the prevention and deterrence goal cited previously. Only once did a project report that no impact had been made toward attaining a particular goal: coordinating community-wide public safety services.

Impacts on End Users and Other Community Members

As explained in the application guidelines for the 1995 program year, "Since the success of the NII will depend on both its accessibility and the value it offers to end users, projects supported by the TIIAP must demonstrate a high degree of attention to the needs, skills, and working conditions of the targeted end users." With this directive in mind, this section uses data from the mail survey and the case studies to describe the geographic distribution, the socioeconomic characteristics, and the numbers of individuals who were direct end users of the information infrastructure supported by TIIAP.

Beyond the immediate benefits on those individuals directly involved with project equipment and resources, TIIAP projects have the potential to stimulate broad, indirect benefits on the larger community by improving access to information, improving public services, and reducing disparities. Consequently, this section also examines the impacts of projects on indirect beneficiaries within the broader community.

Disadvantaged and Underserved Populations Affected by TIIAP Projects

The application guidelines from 1995 heavily stress the importance of "reducing disparities in access to and use of the National Information Infrastructure." To this end, the survey obtained information on the extent to which projects provided benefits to disadvantaged or underserved community segments, either as end users or as indirect beneficiaries. We found that the vast majority (90.2 percent) of TIIAP projects did, in fact, serve to advance populations that had limited access to information infrastructure. The survey also obtained information on the specific types of disadvantaged populations that were served by the 1994 and 1995 demonstration and access projects.

As shown in Table 4-1, rural areas were targeted most frequently by TIIAP projects. Nearly two-thirds of the demonstration and access projects reached end users (65.2 percent) and indirect beneficiaries (61.4 percent) in rural areas. However, the percentages of projects benefiting people living in geographically isolated areas and people living in conditions of extreme poverty were nearly as high (59.8 percent and 59.1 percent for end users and 57.6 and 66.7 percent for indirect beneficiaries, respectively). Two other disadvantaged groups, Indian tribes and residents of Mexican-border communities, were reached much less frequently. This is not surprising, however, given that members of these two groups live in distinct geographic locations. The more frequently served groups are, conversely, more pervasive across the country. Exhibits 4-4 through 4-7 provide examples from the case studies of projects that served underserved community groups.

Exhibit 4-4
Example of a project serving geographically isolated communities

QUALITY EDUCATIONAL SCHOLASTIC TRUST, INC.
1995 Access Project in ECLL

Berkshire County, Massachusetts, is an isolated county with many small communities. The county extends from the Connecticut border to the Vermont border. It is bounded on the west by New York State, and its eastern and western terrain is mountainous, thus forming an effective barrier from the larger metropolitan areas in the northeast. The Berkshire Mountains make travel hazardous during the winter months and preclude network technologies relying upon the line of sight. Consequently, exposure to educational resources and technology advances is severely restricted for students and faculty in the county. Prior to the TIIAP award, Berkshire County's technical infrastructure was rudimentary. The nearest Internet point of presence was Springfield, Massachusetts, about 50 miles east of Pittsfield. Because of the rurality of the area, the geographic isolation, and the discouraging economic situation, communication among students in the county was difficult and their ability to access information resources such as the libraries of larger universities or cities was restricted. The project accomplished its goal to connect 40 public schools and colleges, comprising over 15,000 students and educators, to the Internet and to each other, thereby reducing the isolation that has traditionally hampered schools in the county and providing a wealth of educational resources and opportunities previously unavailable.

Source: 1998 case study.

Table 4-1
Percentage of TIIAP projects benefiting underserved community groups as end users and indirect beneficiaries: 1994 and 1995 demonstration and access grants (n = 135)

Community segment	End users	Indirect beneficiaries
Rural	65.2	61.4
Geographically isolated	59.8	57.6
Extreme poverty	59.1	66.7
Inner city	47.7	48.5
Limited English speaking	42.4	55.3
Disabled	42.4	48.5
Illiterate	34.1	50.8
Tribal	23.5	29.5
Mexican-border communities	4.5	4.5

Note: Respondents could select more than one item.

Source: 1998 mail survey of TIIAP grantees.

There were no major differences between demonstration and access projects in the extent of impact on disadvantaged community groups. Only one trend emerged across the five application areas, that is, health projects were less likely to include the following groups as end users: people living in extreme poverty (28.6 percent of health projects), limited English speaking people (21.4 percent), and disabled people (14.3 percent). This may reflect the fact that a higher proportion of end users in health projects were physicians or medical technicians who were performing highly intricate functions.

Geographic Regions Affected by TIIAP Projects

Survey respondents were also asked to designate the geographic region that best described the distribution of their projects' end users and indirect beneficiaries. Not surprisingly, end users

tended to be concentrated (e.g., in a single community), while indirect beneficiaries were more dispersed (e.g., all counties in a state). Specifically:

- About two-fifths (40.2 percent) of projects reported that their end users spanned two or more counties in a single state. These end users were about equally likely to be from two or more adjacent counties, two or more non-adjacent counties, or all counties within a state. In addition, about one-third (34.4 percent) of projects reported that their indirect beneficiaries spanned two or more counties in a single state. However, unlike end users, indirect beneficiaries were most likely to come from all counties in within a state.

Exhibit 4-5
Example of a project serving people living in poverty

LEADERSHIP, EDUCATION, AND ATHLETICS IN PARTNERSHIP (LEAP)
1994 Demonstration Project in ECLL

Leadership, Education, and Athletics in Partnership (LEAP) in New Haven demonstrated how electronic communications could be made accessible to low-income communities and community-based youth organizations. The project was designed to develop technology leadership and expertise within and through the youth center, in order to engage the youth that these centers serve in the use of electronic communications in meaningful ways. Housed in an after-school and summer program for 500 low-income African American and Latino children aged 7 through 14, the program developed and implemented curricula focused on electronic communications and emerging computer technologies. The TIIAP project and Plugged In, a partner youth organization across the country, conducted a collaborative Internet exercise, a "virtual road trip," to demonstrate how the Web could be used as a teaching tool and to engage students from the two locations in the same project. Low-income youth and their communities were served through these two programs and eight others the project worked with around the country.

Source: 1998 case study.

- Over one-quarter (28.0 percent) of projects reported that their end users were concentrated in a city, town, or county. A somewhat smaller proportion (21.6 percent) indicated that their indirect beneficiaries resided in a single community.

- Only 15.0 percent of projects reported that their end users were located in two or more states. A somewhat higher proportion (19.2 percent) indicated that their indirect beneficiaries spanned two or more states. Project end users were equally likely to be from 2 or more adjacent states, 2 or more non-adjacent states, or all 50 states. Project indirect beneficiaries, on the other hand, were much more likely to come from all 50 states.

- Few projects (15.2 percent for end users and 19.2 percent for indirect beneficiaries) reported that their region of impact was limited to a single metropolitan area, i.e., a central city and its adjacent counties.

- Only six projects (4.6 percent) reported that their end users came from two or more countries. One of these projects involved the U.S. and Mexico, another involved the U.S. and Canada, and the remaining four reported that project resources were used globally via the Internet. A slightly higher, but still small, proportion of projects (8.8 percent) reported that their indirect beneficiaries resided in two or more countries.

Public services projects were most likely to indicate that their end users and indirect beneficiaries resided in two or more states (34.6 percent and 33.3 percent, respectively). In addition, projects in this application area were less likely to designate their region of impact as being single city, town, or county (14.8 percent for end users and 7.4 percent for indirect beneficiaries).

Magnitude of Impact

A key indicator of a TIIAP project's impact is the number of individuals who become end users of

project equipment or resources. Unfortunately, it can be difficult for survey respondents to quantify the precise number of end users (especially since grant recipients were not required to keep track of the number of individuals directly and indirectly affected by their projects). One basic problem is that TIIAP expects projects to provide safeguards to protect the privacy of end users. While this is an important and worthy expectation, it makes it difficult compile the data needed to monitor who is using project equipment. In addition, absent a program requirement, the majority of projects are not going to devote scarce resources to maintaining an ongoing and unduplicated count of individuals using TIIAP-supported resources.[19]

Exhibit 4-6
Example of a project serving tribal communities

OKLAHOMA DEPARTMENT OF COMMERCE
1995 Demonstration Project in Public Services

The Oklahoma Department of Commerce's mini-grants project that provided funding to communities to build their local infrastructure through multiple public access sites included several tribal groups. Overall, TIIAP funds supported 16 mini-grants (another 17 were funded by Southwestern Bell but organized under the same TIIAP project). Many of these communities include sizable tribal populations, and the two communities visited during the site visit had taken steps to expand Internet access to local tribal members. The Chickasaw Nation took a lead role in managing one of the projects and conducted a variety of outreach activities, such as articles in their newsletter and information booths at community events, to inform community members about the project.

Source: 1998 case study.

[19] This is especially true in cases where equipment is housed in a public setting. Keeping an accurate count of end users in a public library, for example, often requires a large investment of time by project staff. Furthermore, the implementation of burdensome monitoring requirements may be counterproductive if these procedures discourage potential users who are reluctant, rushed, or simply value their privacy.

An entirely different set of monitoring difficulties comes into play with Web-based project resources. Although it is a fairly simple matter for a project to purchase or develop software to monitor the number of hits received at a particular website, it is not possible to determine the number of different people who have accessed a given site.

Despite these difficulties, it is important to get a sense of the overall magnitude of a project's impact. Survey respondents were asked to estimate the approximate number of end users who had been directly served by their TIIAP project up until the time of the survey.[20] In total, the 126 TIIAP projects from 1994 and 1995 that responded to this survey item estimated that they had served over 10 million end users. The number of end users served by an individual project ranged from a minimum of 15 to a maximum of 5 million (for a health demonstration project). The majority of projects, however, reported serving between 400 to 20,000 end users.

To gain an understanding of the relative magnitude of impact across the two project types and three largest application areas,[21] a two-way analysis of variance test was conducted.[22] The results of the two-way analysis of variance showed no differences in the numbers of end users reported across the five application areas. Surprisingly, a one-way analysis of variance found no difference in the number of end users served to date by 1994 and 1995 projects.

Finally, Pearson product-moment correlation coefficients were calculated to determine whether there was a relationship between the number of end users served and either the size of the grant

[20] The mail survey was conducted in summer 1998, meaning that the 1994 projects received their awards 3 ½ - 4 years prior and the 1995 projects received their awards 2 ½ - 3 years prior.

[21] There were too few projects in the health or public safety application areas to include them in the analysis.

[22] As part of this analysis, the number of end users reported for each project was first transformed using a logarithmic function because the extremely high numbers of end users reported by several projects would have erroneously biased the analyses.

award or the length of the project period. There was no correlation between size of award and number of end users, which indicates that projects funded at higher levels do not necessarily serve greater numbers of people. There was, however, a small but significant correlation between the length of the grant period and the number of end users impacted (r=0.21, p<.01).[23] This suggests that funding projects for a longer duration to ensure that they have adequate time to get up and running may pay off in terms of the number of end users who are ultimately impacted.

Types of Community Segments Affected by TIIAP Projects

Survey respondents were also asked to indicate whether their end users and indirect beneficiaries were consumers or providers of information or services in each of the following community segments: community services, government agencies, public safety, education, and health care. For each applicable community segment, respondents were further requested to estimate the numbers of end users and indirect beneficiaries for several distinct categories:

- **Education Community.** As shown in Table 4-2, four-fifths (80.6 percent) of projects reported that they provided services to the education community. While this trend was evident for the two largest application areas (community networking and ECLL), it did not hold for the remaining areas. Within the education community, far more students than school faculty and staff were given access to project equipment and resources—over 300,000 K-12 students and over 200,000 higher education students in total. It is interesting to note that fewer people benefited indirectly than directly from the project. This pattern of impact did not occur for any other community segment.

Table 4-2
Percentage of TIIAP projects benefiting key community segments, by application area: 1994 and 1995 demonstration and access grants

Community segment	Application area					Total (n = 135)
	Community networking (n = 36)	ECLL (n = 53)	Health (n = 16)	Public safety (n = 3)	Public services (n = 27)	
Education	91.7	95.8	37.5	0.0	73.1	80.6
Community service	88.9	58.8	50.0	0.0	92.6	71.4
Government	69.4	46.9	62.5	66.7	80.8	62.3
Health	38.9	17.6	93.3	0.0	30.8	34.4
Public safety	27.8	6.1	26.7	100.0	30.8	21.7

Source: 1998 mail survey of TIIAP grantees.

[23] Although the number of end users reported by 1994 projects is slightly higher than for 1995 projects because they have been in operation for an additional year, the average grant period (i.e., the number of months from receipt of award to the funded project's end date) was essentially the same for projects from each program year—18-20 months.

Exhibit 4-7
Example of a project serving Mexican-border communities

PROJECT NETMOBILE
1995 Demonstration Project in ECLL

The NETmobile project located near the Mexico border in Edinburg, Texas, in the Rio Grande Empowerment Zone, a four-county, 1,000 square mile region with a population of about 30,000. The Empowerment Zones were created through Federal legislation to allow selected areas to receive additional assistance and benefits and to become laboratories for innovation. The zone has at least 50 percent of the population below the poverty level and a 30 percent unemployment rate. Each county ranks at the bottom of almost every socioeconomic indicator, with more than 35 percent of residents living below the poverty level. The official unemployment rates range from 17 to 23 percent, and the average educational attainment level is only grade level 6.7. Within the designated Empowerment Zone areas lie "colonias," or rural ghettos, in which people live in absolute poverty, without running water, electricity, or garbage disposal. In this environment, the NETmobile was able to help students in the region find a way out.

Overall, the NETmobile enabled students to use technology not previously accessible to them. Some teachers had students use the Internet to access information on college and universities; other schools had students learn about different careers through the Internet. For example, through COSTEP, a nonprofit organization that provides financial aid assistance for students and is the fiscal agent for the state's Empowerment Zones, students were able to get closer to attending college. Students at every high school in an Empowerment Zone receive software developed by the U.S. Department of Education that enables them to complete and submit Federal Assistance for Student Financial Aid applications through the Internet. However, most high schools in the Empowerment Zones do not have adequate Internet capabilities to fully utilize the financial aid software. The NETmobile has been employed at COSTEP's request to visit high schools in the local Empowerment Zone and help students apply electronically for financial aid. The electronic application procedure reduces the time required for processing the financial aid forms from approximately 6 weeks to 10 days.

Source: 1998 case study.

- **Community Services.** Almost three-quarters (71.4 percent) of projects reported benefiting providers and consumers of community services. This finding was especially strong among public services projects, 92.6 percent of which reported serving end users from this community segment. The number of end users reported for patrons of libraries and museums was far higher than that for any of the other 12 categories of community services populations and, in fact, was the highest among all 39 categories addressed within any of the five community segments. Over 3.5 million patrons of libraries, museums, and other cultural organizations were reported to be end users of project equipment and resources.[24] The number of indirect beneficiaries reported among providers and consumers of community services, about 60 million, was also the highest number reported for any community segment.

- **Government Agencies.** A majority (62.3 percent) of projects reported benefiting end users in government agencies. The total number of end users impacted for each group within this category was relatively small, ranging from about 250 tribal government officials to about 11,500 city or municipal government officials. However, projects estimated that approximately 5.5 million indirectly benefited from improved government services. This ratio of indirect beneficiaries to end users was by far the highest for any community segment. ECLL projects were the least likely to directly involve government personnel as end users of equipment or resources.

- **Health Care.** One-third (34.4 percent) of projects reported benefiting health care consumers or providers. These projects reported a total of 4,000 end users (most of

[24] It is likely that some respondents provided estimates of the number of registered patrons at a library site that houses project equipment rather than the number of people who have actually used the equipment.

Exhibit 4-8
Example of a project that benefited an entire community

TRI-STATE NETWORK DEMONSTRATION PROJECT
1994 Demonstration Project in ECLL

Perhaps the most important indicator of the success and the impact of the Tri-State Network Demonstration Project in Starkville, Mississippi, is the tremendous level of community support that was garnered in an initially reluctant population. Community members became involved in all aspects of the project. The educational aspects of the project in particular should establish lasting impacts on the county's teachers and students. And the economic development supports and resources developed through the project have encouraged local industry to take advantage of worldwide commercial opportunities available via the World Wide Web and encourage businesses and industries to locate in the area. Overall, the project's impact will be widespread, encompassing education, industry, and community development.

Through the Tri-State Resource Center (TSRC) and under the direction of the Mississippi Department of Economic and Community Development (MDECD), economic development was a major thrust of the project. The TSRC provided assistance to businesses and industries within the region in a variety of ways. These included providing technical support and expertise in 1) simple and complex networking, 2) a wide range of telecommunications technologies, 3) integrated facility management, 4) the Internet and World Wide Web access, 5) Web/homepage development, and 6) strategic planning.

The TSRC's primary efforts centered on supporting and enhancing existing regional economic development infrastructures. A unique "electronic incubation" concept was developed by the TRSC team that created a virtual business incubator to foster the development of new small businesses within the region. The central focus of the electronic incubator was to jump-start individuals within the region to venture into businesses that took advantage of the telecommunications network.

It is important to note that several new technology-related small businesses were spawned in the region as a result of the impact of this project. Computer sales climbed dramatically after the network was installed. Over 300 personal computers were sold to county residents in a 3-month time frame. In addition, three new ISPs and one new computer retailer were initiated.

Source: 1998 case study.

whom were patients receiving health care services) and 50,000 indirect beneficiaries. The modest number of health-related end users and indirect beneficiaries is due, in large measure, to the relatively small number of TIIAP health projects.

- **Public Safety.** Less than one-quarter (21.7 percent) of the projects provided benefits to the public safety community. Virtually all of the 750,000 public safety end users were recipients of law enforcement services.

Exhibit 4-8 provides an example of a project that benefited multiple segments within one community.

IMPACTS ON GRANT RECIPIENTS AND PROJECT PARTNERS

Aside from the many impacts on communities and users, TIIAP projects changed the ways grant recipients conduct their businesses. In many of the case study sites, project staff indicated that they are able to communicate better both internally and externally. Several indicated that their businesses or staff had expanded. Most often, project staff learned something more about the technologies they were using or the information to which they were providing access (Exhibit 4-9). Exhibit 4-10 describes how the partner's of one project benefited from the project.

Staff members in projects also benefited. One of the problems many projects faced was staff turnover. This is in large part due to the labor market for highly skilled high-tech workers. While staff turnover is a problem for the TIIAP projects, it can also be a benefit for their staffs. Many took knowledge and skills they acquired through the TIIAP projects and went on to paid full-time positions in high-tech companies. But, as described in Exhibit 4-11, many who did not leave were able to reap benefits too.

Relationships Between Grant Recipients and Partners

Over half (52.7 percent) of the survey respondents reported that their relationship with partner organizations changed as a result of the project. Over 90 percent of these respondents reported stronger and expanded working relationships with and among partner organizations. In many cases, the organizations continue to share information and work closely on the continuation of the project. For example, according to one respondent organization:

> *There is an ongoing increase in interactions among the network sites as the interrelationships strengthen. Colleagues are becoming resources to each other, and the technical assistance requested from colleagues is more clearly defined and indicative of continuing site development.*

In many other cases, new joint ventures were initiated, many of which were direct outcomes or expansions of the TIIAP project, as shown in this statement:

> *We work together more intimately. They now conduct workshops for us, provide technical support, and are willing to expand the project. They have included us in other grants such as the Eiffel grant and will include us in future grants. We also have attended and conducted panel discussion groups at Teachers College.*

In a smaller number of these cases, the TIIAP project was a catalyst for the formalization of partner relationships through the establishment of a consortium or a nonprofit organization to coordinate activities, purchase resources, or pursue funding opportunities (see Exhibits 4-12 and 4-13 for examples).

While most projects were optimistic about having continuing relationships with their partners, a few respondents did offer some cautionary notes. For example, the following responses illustrate that the future of some partnerships was still undecided.

Exhibit 4-9
Example of a grant recipient that gained increased knowledge about its field as a result of the TIIAP grant

SAFETYNET—NEW HAMPSHIRE
1995 Access Project in Public Services

The Children's Alliance of New Hampshire was funded to implement a statewide electronic benefits access program to screen clients against Federal, state, and local eligibility requirements after conducting a needs assessment that analyzed access to public and private benefits. In order to develop the electronic screening system, staff researched and summarized the eligibility criteria for the programs that would eventually be included on the system. There were several problems in determining eligibility requirements for each local, state, and Federal program. Initially, Community Action Programs and other local agencies did not want to release eligibility requirements or application forms. They were concerned about client confidentiality issues. In other cases, programs had eligibility requirements that were based on nonmonetary measures. For example, the criteria for developmental disability programs were based on cognitive measures rather than financial criteria. When the project received the initial set of program descriptions from various state and local agencies, the project director realized they were too poorly written to be used for the electronic system and had to be rewritten and verified. Once a program was added to the electronic system, staff still had to track changes in requirements or programs. This research work increased the Children Alliance's knowledge of the welfare system and technology issues, as well as providing them with valuable contacts at the state and local levels. It also gave the organization more credibility.

Source: 1998 case study.

During the project operation, there was a greater degree of interaction.

We hope it will continue in the development of our local Internet system. We are not sure how it will turn out.

PROJECT REPLICATION AND DISSEMINATION

Two important objectives of TIIAP are to (1) identify potentially promising practices that can inform the practical application of future technological innovations, and (2) disseminate information about TIIAP-supported approaches to other communities that want to enhance their use of the information infrastructure. As such, an important outcome of any TIIAP project is the extent to which its approach is eventually replicated or adapted by other communities. This section addresses the extent to which projects viewed their activities as being worthy of replication, as well as the extent to which projects were able to disseminate information about TIIAP-related approaches to other outside organizations.

Exhibit 4-10
Example of a project's partners benefiting from their TIIAP grant experiences

PROJECT INTERLINC
1995 Access Project in Community Networking

Two of the project partners from Project InterLinc in Lincoln, Nebraska, Aliant Communication and Information Analytics, both of which provided reduced rates in services, were able to expand. Although Aliant had previously established itself as a telecommunications company in the Lincoln area with the explosion of the Internet, InterLinc helped establish a client base, especially in the rural area. Project InterLinc increased Aliant's opportunities to provide new services to the growing population of Internet users. InterLinc's success also assisted Information Analytics as they continued to grow in the Lincoln area. Since 1985, they had been contracting with the city government and had previously established a partnership with Aliant. As part of the project, the company had the opportunity to build products that would later be marketed for other projects. The growth of the company also allowed the company to bring on new staff. The media attention and advertisements provided on InterLinc websites were added benefits for the project partners.

Source: 1998 case study.

Replication and Innovation

As shown in Table 4-3, 85.9 percent of 1994 and 1995 demonstration and access projects (and all of the community networking demonstration projects) considered their TIIAP projects worthy of replication. This finding was corroborated by our own observations at the case study sites.

Mail survey respondents were also asked to rate the quality of their innovations. As shown in Table 4-4, 69.6 percent of projects "strongly" or "moderately" agreed that their project innovations provided a "marked advantage" over alternative ways of providing similar services. Further, 75.6 percent of projects indicated that their innovations were easily documented and, therefore, could be easily communicated to others. Just over two-thirds (68.9 percent) indicated that their project innovations could be easily implemented by others with *a reasonable amount of effort and expense*. It is important to note that some of the case study respondents indicated that their projects' success was tied to a unique combination of factors (e.g., an existing cadre of partners with the necessary technical skills and strong support among influential stakeholders). As such, they cautioned that the absence of these critical factors might have thwarted their own efforts (and, hence, the efforts of other sites that attempt to replicate their approach).

Table 4-3
Number and percentage of TIIAP projects considered worthy of replication, by application area: 1994 and 1995 demonstration and access grants

Type	Application area										Total	
	Community networking		ECLL		Health		Public safety		Public services			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Demonstration	23	100.0	33	94.3	10	76.9	1	50.0	13	76.5	80	88.9
Access	10	76.9	13	72.2	3	100.0	1	100.0	9	90.0	36	80.0
Total	33	91.7	46	86.8	13	81.3	2	66.7	22	81.5	116	85.9

Source: 1998 mail survey of TIIAP grantees.

Table 4-4
Projects' ratings of innovation: 1994 and 1995 demonstration and access grants

Innovation item	Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree	Not applicable
The innovation brought about by this project provides a marked advantage over alternative ways to provide similar services	44.2	28.7	16.3	5.4	3.9	1.6
The advantages of the innovation introduced in this project are easily documented, demonstrated, and communicated to others	38.0	41.1	12.4	7.0	0.8	0.8
Project equipment and resources are not threatening or intimidating to use	39.5	34.1	10.1	11.7	3.9	0.8
The project's innovation makes the information infrastructure easier to understand and use than it would be otherwise	40.6	25.8	22.7	3.1	3.1	3.9
The innovation brought about by this project can be easily implemented by others with a reasonable amount of effort and expense	40.3	31.8	13.2	11.7	3.1	0.0

Note: Figures reported are estimates made at the time the survey was completed.
Source: 1998 mail survey of TIIAP grantees.

Dissemination

Dissemination Activities. Most (80.7 percent) of the mail survey respondents reported that they had shared information about their projects with other organizations.[25] As shown in Table 4-5, projects reported responding to almost 79,000 unsolicited requests for information or technical assistance. This is an important finding, since it suggests that TIIAP-supported projects were generating considerable interest among other organizations seeking to replicate or adapt their approach.

In addition, projects reported providing tours or technology demonstrations to almost 5,500 organizations. The case studies provided some rich examples of projects that had taken steps to disseminate information to other organizations. One site, Grace Hill, has traditionally placed considerable emphasis on disseminating

[25]For all but two of the dissemination channels contained on the survey, approximately 10 percent of respondents indicated that they did not know the number of organizations or individuals receiving TIIAP-related information. For the remaining two categories (Internet website, listserv) approximately 15 percent of respondents indicated "don't know" as their response.

information about its services to organizations outside of the St. Louis metropolitan area. Throughout the project, Grace Hill hosted tours (an average of four to five per month) for government officials, university students, professors, social service agencies, and international visitors. The tours, designed to inform other projects that want to replicate the Grace Hill approach, are led by "neighborhood ambassadors" who benefited from the program that TIIAP supported.

Table 4-5
Number of organizations receiving project information through key dissemination channels: 1994 and 1995 demonstration and access grants (n = 135)

Dissemination channel	Number of organizations
Internet website	40,200,570
Listservs, newsgroup, or electronic bulletin board	10,106,828
Casual Internet correspondence	924,153
Article, report, or other written publication	335,307
Casual conversation	325,797
Marketing efforts and advertising	116,265
Responses to unsolicited requests	78,895
Meeting, conference, or other event	31,856
Technology fairs, job fairs, or other community events	11,680
Site visits, tours, or technology demonstrations	5,489

Source: 1998 mail survey of TIIAP grantees.

The survey also found that TIIAP-supported projects provided written materials to over 335,000 organizations (although some of these materials may have been designed to describe the project to potential end users, as opposed to external organizations). Some projects developed academic papers about their TIIAP projects, activities, and outcomes. For example, NetWellness published or presented papers in over 20 journals or conferences, including the 9th World Congress on Medical Informatics in Seoul, Korea, *Healthcare Demand & Disease Management*, *Journal of the American Medical Informatics Association*, the Annual Conference on Rural Datafication, and the Finding Common Ground Conference at Harvard University, among others. Over 25 articles have appeared newspapers, including the region's two largest newspapers, the *Cincinnati Enquirer* and the *Kentucky Enquirer*.

Finally, over 50 million organizations received information about TIIAP-related activities via an Internet web site or through other electronic communications (e.g., listservs, newsgroups, electronic bulletin boards). However, this finding should be used with caution, and several caveats are worth noting. First, this figure is inflated by a few projects that reported millions of organizations received information via the Internet. In fact, approximately 85 percent of projects that reported disseminating information via the Internet indicated that they reached fewer than 1,000 organizations through this approach. Second, this figure likely includes results from outreach activities that were designed to inform potential end users about the project (as opposed to dissemination activities designed to help other projects looking to replicate the project's approach). Third, this figure likely includes individuals who were "surfing the net" and, therefore, may not have actually stopped to read the information.

Surprisingly, across all dissemination categories, there was no difference in the extent of dissemination reported by the 1994 and 1995 projects. To gain an understanding of the extent of project dissemination across the two project types and three largest application areas,[26] a two-way analysis of variance test was conducted.[27] The results of the two-way analysis of variance showed no differences in the numbers of dissemination

[26]There were too few projects in the health or public safety application areas to include them in the analysis.

[27] The total number of organizations that received information and/or technical assistance from each project was first transformed using a logarithmic function because the extremely high numbers of organizations reported by several projects may have erroneously biased the analyses.

recipients reported by projects of different type or application area. Nor were any interactions between these two variables found. In addition, Pearson product-moment correlation coefficients were calculated to determine whether there was a relationship between the number of organizations reached and either the size of the grant award or the length of the project period. There was no correlation between size of award and number of dissemination recipients, which indicates that projects funded at higher levels did not necessarily reach greater numbers of people. There was, however, a fairly strong correlation between the length of the grant period and the number of dissemination recipients (r=0.30, p<.01). This suggests that funding projects for a longer duration to ensure that they have adequate time to get up and running improves the extent of a project's dissemination activities.

Impact of Dissemination Activities. Just over one-quarter (38 projects, or 28.1 percent) of 1994 and 1995 demonstration and access projects indicated that an outside organization had taken steps to replicate or adapt their approach. Survey respondents in these 38 projects identified an average of 2.47 outside organizations (or a total of 94 organizations) that had adopted ideas from their projects. Exhibit 4-14 provides an example of a health project that is actively helping others replicate the project. In addition:

- One project (Loyola University City College in New Orleans) cited an association that applied for a 1998 TIIAP planning grant to design a collaborative telecommunications network based on the activities of the 1994 demonstration project. The association learned about the TIIAP project from a paper the grant recipient presented at a conference. The network would be planned to facilitate communication among a group of colleges around the country. At the time of site visit, the 1994 grant recipient was taking a lead role in developing the proposal.

- Grace Hill is currently working with the United Neighborhood Centers of America (UNCA), a national organization of settlement houses and neighborhood centers, to provide other social service agencies around the country with software and training about the MORE Time Dollar system. UNCA is in the process of securing funding for the training. In addition, the Annie E. Casey Foundation has written a "how-to" manual for implementing similar neighborhood programs. The Foundation has also underwritten the costs of allowing staff and neighbors from other cities to spend several days at Grace Hill to learn about replicating the system.

- Charlotte's Web staff have worked with numerous community networks around the country, including La Plaza de Taos in Taos, New Mexico, and Tincan in Spokane, Washington. For example, project staff has shared ideas with La Plaza de Taos about

Exhibit 4-11
Example of a project whose staff benefit from their work

LOS ANGELES FREE-NET
1994 Demonstration Project in Community Networking

The Los Angeles Free-Net is a volunteer-run organization, and much of its success is directly attributable to the dedication and enthusiasm of its volunteers. Over 142 volunteers work on all aspects of the project from overall management and technical infrastructure design to user registration and technical assistance and newsgroup moderators. These volunteers report that they are motivated to work with the network primarily by the intrinsic rewards their assistance offers. They feel that they are providing a worthwhile community service, and they recognize that the assistance they provide is critical to the network's success. Many volunteers further report that the intrinsic rewards of their efforts have increased as the network expanded its service and became a more significant and widely regarded community resource.

Source: 1998 case study.

Exhibit 4-12
Example of a project with beneficial partnerships

TRI-STATE NETWORK DEMONSTRATION PROJECT
1994 Demonstration Project in ECLL

A beneficial part of the Tri-State Network Demonstration Project at Mississippi State University (MSU) was the establishment of ties by MSU to the Smithsonian, NASA, and the U.S. Department of Education. The continuation of these ties and the development of future projects with these agencies has been an added benefit from the project. The positive working relationship between these Federal organizations and MSU helped to break down existing barriers typically encountered when states deal with Federal entities. The cooperative nature of this project allowed the state government to maintain creative control of the project while using Federal partners as advisors and mentors.

The project's relationship with the Smithsonian Institution's National Museum of Natural History has led to several additional collaborative endeavors. As part of the educational component of the project, eight middle school teachers were selected to participate in the Smithsonian's Natural Partner's Initiative. The teachers were brought to the museum to acquaint them with the various resources of the National Museum of Natural History and provide the background for curriculum development for four modules that would utilize the Smithsonian's resources and could be accessed by the teachers within the region and across the nation. The modules are being developed with the support of a grant made possible by the Bell South Foundation and represent spinoffs from the Tri-State Network Demonstration Project.

In addition to the relationships with Federal entities, the TIIAP initiative also strengthened ties between MSU and the Tishomingo County Special Municipal Separate School District. Tri-State Project staff from MSU were involved in the development of the district's 1996-97 Educational Technology Plan. Tri-State staff members helped the school district understand the capabilities of existing technology, incorporate Tri-State Network Project plans into the school system's Technology Plan, and recognize the need for additional electronic access including the requirements for additional phone lines.

Source: 1998 case study.

expanding networks and developing public access sites. They have also provided Tincan with technical advice about network operations, business management, rates and fees, and best practices for providing services.

This finding suggests that the TIIAP program is meeting its goal of funding projects that can inform the implementation of future technological innovations. Given TIIAP's recent efforts to promote best practices among its grant recipients (and to encourage grant recipients to share such information with other outside organizations), it will be interesting to examine whether this average continues to grow as the program matures.

IMPACT OF TIIAP SUPPORT

Survey respondents were asked to hypothesize what would have happened if their project had not received Federal funding through the TIIAP program. Three-fourths (75.2 percent) of projects believed that they would have never been implemented without the support they received from the TIIAP program (the remaining 24.8 percent indicated that they would have been implemented using alternate funding sources). While these findings were consistent across the five application areas, our analyses suggest that projects receiving a larger TIIAP award appeared to be less likely to believe that they would have been able to obtain alternative funding[28] (see Figure 4-4). This finding probably reflects the fact that projects receiving larger grants perceived they would have had difficulty obtaining a similar amount of financial support from another source. Exhibit 4-15 describes a project that was able to expand its services and scope due to TIIAP funding and would not have been able to do so otherwise.

[28] ($\chi^2_{(2)}=7.82$, $p<.05$).

Exhibit 4-13
Example of a partnership impacting the community

GREATER KALAMAZOO TELECITY – USA
1995 Demonstration Project in Community Networking

Greater Kalamazoo TeleCITY created a partnership that includes Pharmacia-UpJohn Corporation, MCR Industries, and Galesburg-Augusta High School. TeleCITY, MCR Industries, and students from the Galesburg-Augusta High School are working together to recycle used 386 and 486 computers donated by the Pharmacia-UpJohn Corporation. Students and handicapped clients of MCR complete a refurbishment process, which includes:

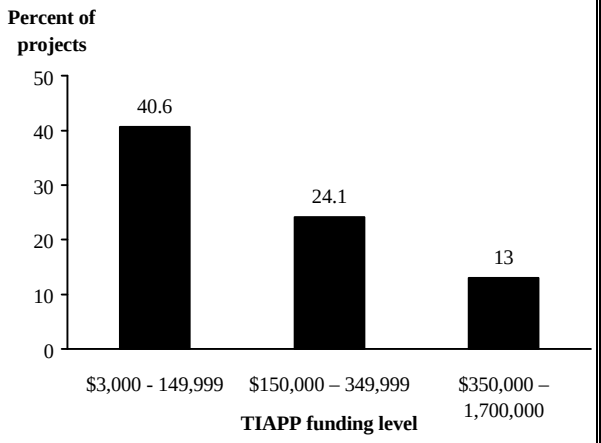
- Disassembling, cleaning, and removing identification tags from the donated equipment;
- Checking basic operating cards and deactivating network systems;
- Formatting hard disks and installing Windows 3.1;
- Installing customized basic shareware programs; and
- Purchasing and installing additional used hardware.

TeleCITY assists with technical training and software issues, as well as distributing the reconditioned equipment. Distribution of the recycled equipment includes donations to community centers for the underserved and senior citizens, grants to economically disadvantaged individuals who successfully complete TeleCITY computer classes, and sales to the general public through secondhand vendors.

Re-deploying used computers provides learning opportunities for local students, incentives for members of underserved populations to learn and utilize computer skills, and revenue for TeleCITY. During its first month, the partnership successfully reconditioned over 100 computers, monitors, and printers. During the second and third quarters of 1997, they recycled 400 more. Many of these computers have network cards and were set up in clusters at neighborhood housing centers. Anticipated revenue, after expenses, is approximately $5,000 per month. This will help to sustain the project as well as aid many community members.

Source: 1998 case study.

Figure 4-4
Percentage of respondents who believe their TIIAP projects would have been implemented in the absence of Federal funding: 1994 and 1995 demonstration and access grants (n = 135)



Source: 1998 mail survey of TIIAP grantees.

Among the small number (33) of demonstration and access projects that believed they would have been able to obtain alternative funding, almost two-thirds (63.6 percent) believed that they would have reached significantly fewer people if they had not received TIIAP funding. An equally high percentage believed that project implementation would have been substantially delayed. And an even higher percentage (84.8 percent) felt that the range of services offered by their projects would have been dramatically reduced in the absence of Federal support. As is discussed in the next chapter, evidence from the survey and case studies also suggest that without TIIAP, projects would have been hindered in their efforts to expand to reach additional end users, to generate spin-off activities, and to serve as models for replication in other communities.

Exhibit 4-14
Example of a project worthy of replication

NETWELLNESS
1994 Demonstration Project in Health

Staff of the University of Cincinnati Medical Center's NetWellness health information website indicated that their project represents an excellent model for other Web-based information services. To promote use of their model and enable other organizations to benefit from their efforts, NetWellness administrators freely offer the software that was developed for the TIIAP project. This commitment to serve as a model is already showing signs of success. Project leaders in conjunction with the Medical Library Association developed a continuing education course titled Developing a Consumer Health Network. Thirty-four medical librarians attended the 1-day course on May 24, 1997, at the University of Cincinnati Medical Center. Since the course has ended, the NetWellness administrators who conducted the course have continued to exchange information with attendees from University of Arkansas and the Oregon Consumer Health Alliance who are attempting to replicate portions of the NetWellness model. In fact, project leaders were invited to the University of Arkansas in 1997 to give a formal presentation about NetWellness and consumer health for the medical group at the university. Also, the State Library of Ohio has adopted many features of the NetWellness model as it begins to develop a statewide online community network called FamilyLink. The content of FamilyLink will be locally driven to provide a wide range of community resources, including NetWellness, to communities throughout the state.

Source: 1998 case study.

Exhibit 4-15
Example of a project that expanded its services as a result of TIIAP funding

COMANCHE COUNTY MEMORIAL HOSPITAL
1994 Demonstration Project in Health

TIIAP funding allowed Comanche County Memorial Hospital to buy telemedicine equipment such as remote cardiac monitoring and video-conferencing equipment, which expanded its services beyond what it otherwise would have been able to provide. Other funds from the state via the Oklahoma Telemedicine Network (OTN) tended to be used only for teleradiology and line fees. Indeed, the combination of the two funding streams (TIIAP and OTN) likely created a synergy that fed telemedicine into the region much faster than would have occurred without the funds. Although teleradiology would have been available to rural hospitals through OTN funds, other telemedicine features such as telecardiology, teletherapy, and continuing medical education may not have come to fruition if not for TIIAP funds.

Source: 1998 case study.